UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

NOV 0 6 2002

VIA *e-mail* and
CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Warren Mueller
Ameren Services
Post Office Box 66149 (MC-602)
St. Louis, Missouri 63166-6149

Dear Mr. Mueller:

RE: Revised Quarterly Groundwater Monitoring and Subsurface Investigation
Missouri Electric Works Site, Cape Girardeau, Missouri

The Environmental Protection Agency (EPA) in consultation with the United States Geological Survey (USGS), Black & Veatch (EPA's contractor), and the Missouri Department of Natural Resources (MDNR) have completed their review of the following Quarterly Groundwater Monitoring and Subsurface Investigation at the Missouri Electric Works (MEW) Site documents: Revised Work Plan (work plan); Revised Sampling and Analysis Plan (SAP); Revised Quality Assurance Project Plan (QAPP); and Revised Site Specific Health and Safety Plan (HaSP). Review of the Draft Groundwater Design Investigation Work Plan has not been completed, and specific comments on this document will not be provided in this letter. All documents were discussed during the conference call of October 29, 2002.

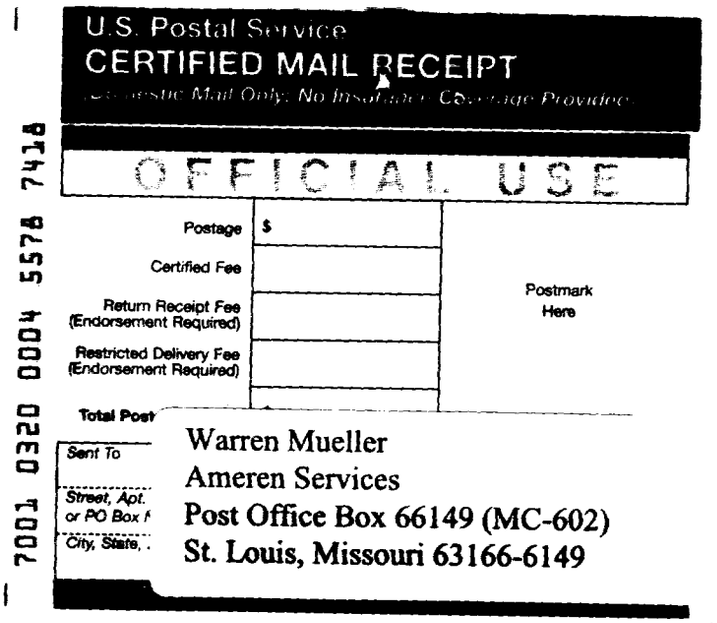
MEW Site File
Break7_032409

The EPA and MDNR are not in agreement with the conclusions reached in the documents concerning the contaminants of concern (COCs) at the site. The statement is made, on page 1 of the work plan, that there is a decreasing trend in concentrations of several COCs (including polychlorinated biphenyls [PCBs]) in the shallow and deeper groundwater (GW) zones. It is our opinion that there are little data to substantiate this statement. In reviewing the data tables, the only well that has an obvious downward trend of COCs is well MW-11 (PCBs only). In fact, several wells show possible upward trends, especially well MW-3 where chlorobenzene concentrations have increased from less than 100 micrograms per liter (ug/L) in 1991 to more

Missouri Electric Works
Site ID: MOD980965982
Break: 7.1

2045022

RECYCLE



U.S. Postal Service
CERTIFIED MAIL RECEIPT
(Domestic Mail Only; No Insurance Coverage Provided)

OFFICIAL USE

Postage $
Certified Fee
Return Receipt Fee (Endorsement Required)
Restricted Delivery Fee (Endorsement Required)
Total Post

Postmark Here

Sent To
Street, Apt. or PO Box
City, State,

Warren Mueller
Ameren Services
Post Office Box 66149 (MC-602)
St. Louis, Missouri 63166-6149

7001 0320 0004 5578 7418

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

A. Signature ☐ Agent ☐ Addressee

B. Received by (Printed Name) NOV 8 2002 C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

1. Article Addressed to:

Warren Mueller
Ameren Services
Post Office Box 66149 (MC-602)
St. Louis, Missouri 63166-6149

Service Type
☑ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Ar
(T

PS F

102595-01-M-2509

MEW Site File
Break7_032410

than 1,000 ug/L in 2002. The off-site well MW-7 also shows detections of chlorobenzene (previously non-detection) suggesting that contamination is now moving off site. This fact seems to be significant and makes consideration of installation of additional downgradient monitoring wells is not being considered. (This was suggested during the meeting held in Kansas City.) Why are the new monitoring wells being installed at less than 70 feet when MW-11 clearly shows contamination at the 115- to 120-foot interval (note that chlorobenzene in MW-11 has increased between 2001 and 2002)?

The documents reviewed are, in general, acceptable with the requirement that specified portions be modified to respond to comments provided in this letter. However, there does appear to be a lack of consistency, and in some cases contradictions, between the documents regarding the constituents to be analyzed in the groundwater samples. The work plan mentions a number of constituents not referenced in the SAP or QAPP. In addition, the QAPP mentions some field parameters that are not discussed in the SAP or the work plan. There are number errors in the lists of constituents to be analyzed and the analytical and preservation methods in the QAPP. The discussion of sample collection and preservation in the SAP is inadequate and inconsistent with the QAPP and work plan. Based on these inconsistencies and omissions, it is difficult to determine exactly what analyses will be will be performed on groundwater samples and how the analytical data for "non-COC" constituents will be used and interpreted.

Specific Comments Revised Work Plan

General Comment – The work plan does not discuss the reasons the proposed new wells are to be installed at their proposed locations, i.e., what new information will be gained and how will the new information assist in the decisionmaking process by installing the wells at the proposed locations.

1. Page 1, Last Paragraph. Well MW-11 appears to have a significant downward trend of PCBs, suggesting that remedial activities have had a positive effect on this well. Why are the new well depths restricted to a maximum depth of 70 feet (p. 10, 1st paragraph)? It would seem that COCs are moving through the bedrock at depths below what these new wells would monitor. If the COCs in MW-11 are the result of downhole contamination during the installation of this well, then which wells have downward trends that are mentioned on page1? Why are the PCBs in well MW-11 decreasing, but the chlorobenzene values staying about the same or increasing?

2. Page 4, Second Paragraph. The citation (2002b) for the Draft Groundwater Design Investigation Plan does not appear to be correct. The citation should be verified for accuracy.

3. Page 6, Objectives. Has the issue of PCBs in the deeper bedrock (e.g., well MW-11) been resolved or have the data from well MW-11 been invalidated?

4. Page 8, Section 4.1.2, First Paragraph, Last Sentence. One trip blank should accompany each cooler containing volatile organic compound (VOC) samples. If only one trip blank is sent to the laboratory, all of the VOC samples must be in the same cooler. One duplicate sample is generally collected for every 10 primary samples. If 13 wells (10 existing wells plus 3 new wells) are sampled during the annual sampling event, two duplicate samples should be collected. A matrix and matrix spike duplicate sample should be added for each sampling event.

5. Page 10, Section 4.3.1. According to the document, boreholes will be reamed with 10-inch (26.7 cm) augers, and a 6-inch (15.2 cm) casing inserted and grouted into position. Pursuant to Missouri Well Construction Rules, 10 C.S.R. 23-4.060(4) "...In all cases, the open borehole portion of the well must be in competent, consolidated bedrock and the casing must extend from the surface to at least five feet (5') into bedrock. The casing must be grouted full length." The construction description in the work plan must include the state requirement for the minimum five-foot key into competent rock and subsequent grouting. This requirement is also missing from the Revised Sampling and Analysis Plan, Section 3.2.2.

6. Page 11 Section 4.3.2. How will the rock core be used to site the 10-foot long well screen locations when only 5 to 10 feet of rock may be cored (p. 10, 1st paragraph)? Will this be the extent of rock coring? If so, the limited coring seems to be of little value for this purpose.

7. Page 11 Section 4.3.2. Will samples be submitted to the laboratory for VOC and PCB analyses if the PID indicates high readings? What volume or weight of soil is to be placed in a ziplock bag for screening purposes?

8. Page 11, Section 4.3.3. A four-foot by four-foot sloped concrete pad that is keyed into the surface grade would be sufficient for pad design. A weep hole should be installed through the metal protective casing to prevent water from accumulating in the well annulus which could cause problems with the integrity of the well. An illustration of the proposed well design should be provided. Protective bumper posts should be installed around monitoring wells to protect the well from moving vehicles.

9. Page 13. The schedule does not discuss when the additional monitoring wells will be installed. There is mention of a draft groundwater investigation report being done in November. What is the projected date and year of that submittal?

10. Table 2 Analytical Results. The last sample listed for well MW-11 has a (P) qualifier that is not defined in the footnotes. This appears to be some sort of duplicate sample, but it contains no PCBs but does have chlorobenzene.

11. Table 2 Analytical Results. The reason or rationale behind the frequency of sampling well MW-8 needs to be provided.

12. Figure 3. The symbol for the proposed monitoring well locations must be included on the legend.

Specific Comments Sampling and Analysis Plan

1. Page 3, Section 2.4. The text indicates that equipment will be decontaminated using isopropanol, followed by nitric acid with a final rinse of de-ionized water. The rationale which resulted in choosing isopronanol instead of the more standard organic solvent methanol needs to be explained.

2. Page 3, Section 2.4. Nitric acid is a harsh agent. The strength of nitric acid which will be used needs to be identified. The procedures for neutralizing the nitric acid need to be specified. If detergent is not used, how will bound particulates to be removed? A de-ionized water rinse is not sufficient to neutralize nitric acid. Typically, if nitric acid is used the procedure is a liquinox-tap water wash, nitric acid, tap-water rinse, de-ionized water rinse, then a final methanol rinse. Using methanol as the final step also serves as a "drying agent". The justification for the proposed decontamination procedures needs to be provided. The work plan mentions that one round of samples is to be analyzed for nitrate; therefore, the use of nitric acid and a washing agent is not desirable. The text offers no discussion on the potential for cross-contamination or how this may be avoided. This should be provided.

3. Page 6, Second Line. The reference on equipment calibration should be to Section 2.5.

4. Page 6, Last Paragraph. The stabilization criteria identified for the field parameters prior to sample collection are not adequate when considering pH and specific conductance. A 10 percent change in specific conductance is a huge variation that says little about the stabilization of water entering the well. Typical limits on specific conductance range from 2 to 3 percent for stabilization. A 10 percent range is too large for pH and perhaps within 0.2 to 0.5 pH units is a more acceptable range. Field measurement should be made every ½ well volume so that a trend can be established.

5. Page 6, Last Paragraph If submersible pumps are used, the pumping method should be described more specifically. The type of pump and the pumping rate should be discussed. The EPA, Region IV, sampling procedures do not recommend the use of centrifugal pumps for sampling groundwater containing volatiles.

   The rationale for allowing water levels allowed to recover to 80 percent of the pre-purge level, or for two hours before sample collection needs to be discussed. Since bailing techniques have been identified as the sample collection method, the top or the water column in the well will be exposed to the atmosphere for a significant time before the samples are actually collected. Any volatiles present will likely vaporize at the atmosphere-groundwater interface. If the concern is to collect a sample that is representative of all intervals within the filter pack, the consideration should be given to lowering or slowing the purge rate.

6. Page 7, First Paragraph, First Sentence. Unless the wells are micro-purged and micro-sampled, three to five well volumes of groundwater should be purged from the wells even if dedicated equipment is used. Three well volumes may be purged if the field parameters stabilize. If the field parameters have not stabilized after three well volumes have been purged, at least two additional well volumes should be purged.

7. Page 7, First Paragraph. The frequency of field measurements made in open-hole completions needs to be specified.

8. Page 7, Section 3.1.2.2. A table listing the sampling locations, analytes, analytical method, number of sample containers, container type, preservation requirements, and maximum holding time should be included.

   The text indicates that should a bubble be present in the VOA vials, the cap will be removed and water added until the headspace is eliminated. Opening of the vial will likely increase the potential for loss of volatiles. The justification for opening the vial and adding water rather than preparing another vial without bubbles needs to be provided. The text on page 8 seems to caution against any agitation and exposure of the samples to the air; opening of the vial would seem contradictory. The QAPP indicates that HCL is to be used to preserve the VOC samples. When and how will the HCL be added? If the vials come "pre-acidified" from the lab, then the SAP should discuss measures taken to ensure the vials are not "overfilled" resulting in the loss of acid.

9. Page 9, Section 3.2.2, First Paragraph. The SAP should be revised to state that the surface casing will be grouted in position via a tremie pipe placed in the annulus between the borehole wall and casing.

10. Page 9, Last Paragraph Encountering contaminated soils during drilling increases the likelihood of carrying contaminants down the hole during auger flight removal and hole reaming procedures. It is understood that the smaller augers are selected because of the use of a continuous soil sampler discussed in Section 3.2.4. If saturated conditions are encountered above the bedrock, then potentially contaminated sediments will be introduced to the water table. A better approach would be to collect soil samples, grout the soil borehole as the augers are pulled, move over several feet and drill with the larger augers to bedrock, and set the surface casing.

11. Page 9, Last Paragraph. The documents do not mention any soil samples being analyzed for laboratory VOCs or PCBs. Resolution of the issue of downhole contamination cannot be completed without PCB analyses of the soil samples.

12. Page 10, Section 3.2.3. The first and second sentence mention a bentonite/cement grout slurry and a high-solids bentonite/cement grout slurry. Is there a difference between these two? If there is a difference, it should be explained. If not, the terminology should be consistent.

13. Page 10, Section 3.2.3. During abandonment of boreholes, grout levels should be kept just inside the bottom flight of augers to ensure that the borehole does not bridge during auger removal. The SAP should be revised to indicate that augers will not be raised in increments greater than 10 feet.

14. Page 10, Section 3.2.3. The SAP should be revised to state that boreholes terminated above the water table that are less than 20 feet deep will be abandoned by placing grout via the tremie method, with the tremie pipe extending to the bottom of the boring rather than "destroyed by continuous lifts originating at the ground surface."

15. Page 11, Section 3.2.4, Second Paragraph. The SAP should be revised to state that the Rock Quality Designator (RQD) of the rock core will be measured and recorded on the boring log.

16. Page 12, First Paragraph The statement that development will proceed until return water is of sufficient clarity is ambiguous. Sufficient clarity on late Friday afternoon may not be the same as on a Monday morning. A turbidity goal should be identified. The means and procedures used to measure the turbidity in a consistent controlled manner should be provided in the text to remove the ambiguity. In the event that the turbidity goal cannot be achieved, a contingency plan identifying the conditions for ceasing development should be described.

17. Page 12, Section 3.2.7. It is assumed that groundwater samples will be used to characterize the purge water and make a determination as to whether it is hazardous or non-hazardous. The sampling plan does not address sampling of the soil/drill cuttings to determine whether they are hazardous or non-hazardous. The method of determining whether or not a media (soil or groundwater) is hazardous or non-hazardous needs to be clearly stated.

18. Page 13, Section 3.5. The number of trip blanks is not determined by the number of primary samples collected. One trip blank should be included in each sample cooler that is submitted to the laboratory.

19. Appendix A, Table A-1. The QAPP and work plan do not mention the use of liquinox in the decontamination of field equipment. This inconsistency needs to be addressed. In addition, two rinses of distilled water are not sufficient to remove all the liquid detergent from sample equipment unless copious quantities of distilled water are to be used. A tap water rinse followed by two distilled water rinses is more appropriate.

20. Appendix A, Table A-1 . Preservative addition to the samples is not mentioned. Will the VOC samples be collected without a preservative? If so, what is the justification? If not, the table is incomplete and needs to be completed. Table 5 in the QAPP indicates that HCL will be added to VOC and TOC samples, H_2SO_4 to COD and hardness samples, and HNO_3 to Anions (one of the many errors in Table 5 of the QAPP). How are these preservatives to be added, by whom, and in what order? The order of bottle filling and preservation order is critical since even vapors from acids such as HCL can cross contaminate VOC and anion samples. Also, gloves should be changed between preservation using different acids. Are the cations or anions to be filtered? How can a total organic compound (TOC) sample be collected using a plastic bailer?

21. Appendix A, Table A-1, Item 6. Appropriate sample bottles need to be identified. The number of bottles has not been provided. The order in which samples are to be collected for other constituent analyses needs to be identified. How will preservation for each constituent be performed?

22. Appendix A, Item 8. As mentioned in #4 above, 10 percent is too large an interval for determining stability.

23. Appendix A, Table A-1. The text mentioned that submersible pumps may be used to collect groundwater samples, but there is no mention of pumps in table A-1. Since the existing wells have been sampled several times now by Komex, they should be able to indicate which wells will be bailed and which wells will be pumped.

24. Appendix A. Table A-3 seems to be missing or the tables are mislabeled.

25. Appendix B. The monitoring well sample form should allow for identification of which field instruments were used for field measurement or how and when the meters were calibrated.

26. Appendix B. The monitoring well sample form should allow for identification of tracking how the samples were preserved, preservative lot number, and whether or not the sample was filtered and the filter media.

Specific Comments Quality Assurance Project Plan

1. Page 3, Last Sentence. The Field Project Manager should also notify EPA of any deviations from the work plan or SAP that occur during field sampling.

2. Page 6, Section 1.4.2. The list is incomplete. For example, there is no mention of drill water loss as mentioned in the work plan.

3. Page 7, Table 1. The analyte list in Table 1 is not consistent with the list in the work plan or the SAP. This table is not consistent with other tables in the QAPP.

4. Page 9, Table 2. Table 2 indicates that the practical quantification limit (PQL) for VOCs using Method 8260B is between 5 and 10 ug/L. The laboratory should be able to meet a PQL of 5 ug/L. This is important since many of the maximum contaminant levels (MCLs) for VOCs are 5 ug/L.

5. Page 17, Table 4. The number of trip blanks is not determined by the number of primary samples collected. One trip blank should be included in each sample cooler that is submitted to the laboratory. A matrix spike/matrix spike duplicate sample should be collected for every 20 samples. Duplicate samples should be collected at the rate of one per every 10 primary samples.

6. Page 18, Second Paragraph. The text mentions that 1:1 HCL is used to preserve water samples, yet other preservatives are listed in Table 5-3. What will be used? The acid used to preserve VOC samples and the "anions" as listed in table should be different. The acid and the associated strength should be identified for both types of samples.

7. Page 18, Table 5. The table indicates that anions are to be preserved to pH<2 with HNO_3 and cations are chilled to 4 degrees C. Will that be the procedure used? Also, the table mentions a number of constituents or tests that are not mentioned in the SAP or work plan such as coliform bacteria, BOD, COD. If these parameters are going to be analyzed, they should be identified, described, and collection methods described in the SAP and work plan.

8. Page 18, Table 5. What impact does chilling to 4 degrees C have on laboratory-specific conductance measurements? If laboratory results are going to be used, a discussion as to why the laboratory values are more reliable than those measured in the field needs to be presented.

   Neither the QAPP nor SAP addresses the issue of cross contamination with regards to using various preservatives. Samples should be stored in separate coolers, gloves should be changed between various preservatives, and the order of preservations should be discussed. These are critical issues to insure sample preservation and handling do not introduce error into the data.

9. Page 19, Section 2.2.2, Second Paragraph, Second Sentence. The sentence does not seem to be complete.

10. Page 22, Section 2.5.1.1. The analyses performed on equipment do not appear to be specifically listed in the Revised Work Plan. The section of the work plan should be referenced or the type of analyses should be listed at this location of the QAPP. The potential sources of contamination listed in the last sentence do not appear to be associated with equipment blanks.

    A discussion of how the equipment blanks will be prepared is needed. Rinsing homogenization equipment (stainless steel bowl) with DI water seems inappropriate as no sample homogenization or homogenization equipment is mentioned elsewhere in the QAPP, work plan, or SAP. Ordinary de-ionized water is not suitable for processing blanks for organic constituents

11. Page 23, Section 2.5.2.1. Field duplicates are generally collected at the rate of one sample per 10 primary samples.

    The text mentions that duplicate field measurements also will be taken for pH, specific conductance, temperature, and other field measurements. No other field measurements are mentioned in the work plan and SAP except for water level and field PID readings. Are additional parameters going to be measured in the field? If so, what are they? A discussion of why and how are needed.

12. Page 25, Section 2.7. The text mentions calibration for turbidity and dissolved oxygen, yet these measurements are not mentioned elsewhere in the QAPP, the work plan, or the SAP.

13. Page 25, Section 2.7. The text says that calibration notes will be made on field forms or in notebooks attached to the meters. However, the field forms in the SAP have no provisions for recording such data; and there is no mention in the SAP about field books with the meters.

14. Page 33, Section 4.2.2. Since there will not be a large quantity of data generated, it will be difficult to prepare a meaningful PARCC report if only 10 percent of the data is validated. We recommend that all of the data be validated rather than only 10 percent of the data.

Specific Comments Health and Safety Plan

1. Page 8, Section 4.2.1. Table 1, referenced under the inhalation hazard, does not appear to be included in the HaSP.

2. Page 12, Section 4.4. Some of the measured contaminant concentrations shown in this section do not agree with the Quarterly Groundwater Monitoring Report (Fourth Quarter) submitted by Komex. For example, trichloroethylene (1,2,4-TCE) was measured at a concentration of 40 ug/L in MW7 on June 20, 2000; 1,4-DCB was measured at a concentration of 37 ug/L in MW3 on June 20, 2000; chlorobenzene was measured at a concentration of 1,600 ug/L in MW3 on January 23, 2002; and PCB was measured at a concentration of 110 ug/L in MW5 on April 25, 2001. Benzene was not included as a COC even though it was measured above the MCL.

3. Page 14, Section 5.1. Table 2 does not appear to be included in the HaSP.

4. Page 28, Section 6.4. Table 3 does not appear to be included in the HaSP.

Discussion of the drilling methods for monitoring well installation were discussed during our conference call. Only general comments on the content of the Draft Groundwater Design Investigation Work Plan have been provided.

If you have questions, please contact me at (913) 551-7701 or via e-mail at france-isetts.pauletta@epa.gov.

Sincerely,

Pauletta R. France-Isetts
Remedial Project Manager
Missouri/Kansas Remedial Branch
Superfund Division

cc: Don Van Dyke, MDNR
Jeff Imes, USGS
Chuck Hunnewell, Siemens
Shawn Roberts, Komex
Sandra Rudolph, Philips
Dave Sanders, B&V